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## Not so peaceful atom: how explosions were carried out in the USSR for economic purposes

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Photo: [TASS](#) / Moshkov Nikolay

***When we hear the phrase "peaceful atom", the energy sector comes to mind. However, the time of developing atomic power was a time of grandiose projects in a variety of areas. In the USSR, nuclear explosions were used to increase oil recovery, search for minerals, bury chemical waste, stop gas fountains, and even try to change the direction of rivers.***

"Guys, you see what a force created by the atom is wasted," said Igor Kurchatov in 1951 after the successful test of a modernized version of the first atomic bomb. "After all, it is unlikely that it will ever be used for military purposes. And we should seriously think about its use for peaceful purposes. After all, there are so many problems in the national economy that can be solved with great effect using atomic explosions. Take, for example, the creation of reservoirs, the digging of canals to transfer water resources from northern rivers to the southern agricultural regions of the country, the opening of ore layers in mountain deposits. And who knows how many problems can be solved using such a huge force as an atomic explosion."

Kurchatov's ideas were not in vain: from 1965 to 1988, the USSR implemented the state program "Nuclear Explosions for the National Economy." A total of 124 peaceful nuclear explosions were carried out, 118 of which were outside special test sites. 80 explosions were carried out on Russian territory, the rest were in the Kazakh, Turkmen, Uzbek, and Ukrainian SSRs. All explosions were underground.

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"It was a large program, classified at the time," says **Valery Fedorovich Menshchikov**, member of the public council of the state corporation Rosatom, co-director of the Nuclear and Radiation Safety Program of the Center for Environmental Policy of Russia. "The explosions were carried out not only for the Ministry of Geology, but also for other departments that no longer exist today. Some of them were justified, including, for example, the creation of a map of seismic events. This was a unique map, the entire territory of Russia has been studied in this regard. However, some of these explosions, from a scientific and economic point of view, did not correspond at all to the tasks and goals, for example, when they wanted to divert the northern rivers to the south, because at that time the Caspian Sea was becoming shallow. This ended in nothing, only the expenditure of enormous funds. Today, some of the secrecy has been lifted, and recently the specialists who carried out these underground nuclear explosions published a huge monograph."

## The Taiga Project and the River Reversal That Never Happened

The "Northern River Transfer" mentioned by the expert was perhaps the most ambitious project of the USSR. In a grand gesture, the Soviet government wanted to provide water to Kazakhstan and Central Asia, which were experiencing a shortage of water for agricultural needs. The Amu Darya and Syr Darya, the Aral and Caspian Seas were becoming shallow, and they wanted to send the Ob, Irtysh, Tobol and Ishim rivers to help. The idea was first proposed to Stalin in 1948 by Academician Vladimir Afanasyevich Obruchev, but it was not taken seriously until later. In 1968, the plenum of the Central Committee of the CPSU ordered the development of a plan for the redistribution of river flows. It was decided to connect the Pechora with the Kama using an artificial canal, so that part of the water would flow to the Caspian. Powerful explosions were recognized as the fastest way to dig a canal. On March 23, 1971, near the border of the Perm region and the Komi SSR, three nuclear bombs with a total power of 45 kilotons in TNT equivalent exploded simultaneously as part of the Taiga project. For comparison, the power of the Little Boy bomb dropped on Hiroshima was 20 kilotons.

"I was living in Chusovskoy at the time. We were asked to leave our homes by 12 noon and warned that something was being prepared in the Vasyukovo area and that it was dangerous to be in the buildings. We already knew that some major work was being done there, the military had arrived," local resident Timofey Afanasyev told reporters. "Of course, we didn't know what exactly was being done. That day, everyone obediently went outside. Exactly at midday, we saw a huge fireball in the north, in the Vasyukovo area, which was twenty kilometers away. It was impossible to look at it, it hurt our eyes so much. The day was clear, sunny, completely cloudless. Almost at the same time, only a moment later, a shock wave arrived. We felt a strong vibration of the ground, as if a wave had passed through the earth. Then the ball began to stretch out into a mushroom, and a black column began to rise upward, to a very great

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height. Then it seemed to break at the bottom and fell towards the territory of Komi. After that, helicopters and planes appeared and flew towards the explosion."

Overall, the experiment was a success: an oblong crater 700 m long, 380 m wide and up to 15 m deep was formed. If not for one "but". Although the charges that were used were "clean", that is, about 94% of the energy of their explosions did not produce radioactive contamination, the remaining 6% produced a radioactive trace 25 km long. Traces of this experiment were even found in Sweden and the United States, which was a violation of international treaties. Apparently, that is why the project stopped there. The crater filled with water and is popularly called the Nuclear Lake.



*Kazakh SSR, Semipalatinsk test site, 1953. The first Soviet thermonuclear bomb RDS-6 with a yield of 400 kt was successfully tested. The crater was formed as a result of an underground nuclear explosion. Photo: Pavlunin V./TASS Photo Chronicle*

## When the forest is cut down, the chips fly

As part of the deep seismic sounding of the Earth ("Program-7"), underground nuclear explosions were conducted in 22 places in the USSR: in the Komi, Kalmyk, Kazakh SR, Ivanovo, Arkhangelsk, Kemerovo, Orenburg regions of Russia, the Yamalo-Nenets Autonomous Okrug, Taimyr, the Buryat ASSR, and the Khanty-Mansi Autonomous Okrug. On the one hand, the program gave Russia a unique map of the structure of the earth's crust, on the other, it was not without casualties.

One of the explosions, "Globus-1", was carried out on September 19, 1971 in the Kineshemsky District of the Ivanovo Region. Residents of the nearby village of Galkino (located 4 km from the explosion site) were told that an underground explosion would be used to search for oil in this place. People were asked to tape up their windows crosswise and go outside at the right time. The charge was placed in a well drilled in the summer at a depth of 610 meters, but they made a mistake in their calculations. After the explosion, hot gases, water, contaminated sand and clay burst out. Some of the radioactive water flowed into the Shacha River, which in turn flows into the Nadoga tributary of the Volga. An attempt was made to drill an exploratory well in this place, which resulted in another release of liquid and



gases. The well was plugged and a sign was posted about a restricted area within a radius of 450 meters. In 1977, contaminated soil was removed by bulldozer and dumped in drilling fluid storage pits along with contaminated clothing and materials.

Unsuspecting villagers used a bulldozer, water pump, generators, even parts of ground structures abandoned on the spot, and collected mushrooms and berries near the explosion site. Soon, two boys died of "meningitis" after climbing into a hole to see if there was oil there. One day, a cow gave birth to a two-headed calf, and women began to suffer from miscarriages and premature births. The region quickly became a leader in blood diseases and oncology. Everyone who could left their homelands; in the early 2000s, only three old people lived in Galkino.



*2001 (30 years after the explosion), measurement of background radiation. Photo: TASS / Moshkov Nikolay*

After 30 years, the radiation background at the explosion site was hundreds of times higher than the natural one, near the epicenter it reached 8,000 microrentgen per hour. Today, the radiation power is about 3 thousand microrentgen per hour. In 2004, a bypass channel was built on the Shacha River, and in 2014-2015, Rosatom carried out work to isolate the wells and decontaminate the area, the radioactive soil was taken to a specialized plant for the disposal of radioactive waste.

## More oil!

"Professors of the Moscow Institute of Petrochemical and Gas Industry (MINKHiGP) named after Gubkin, father and son Bakirov, proposed a calculation showing a significant increase in oil recovery after conducting a high-power explosion in this formation, which will produce strong cracking in the formation body. The required explosion power contained in a small-sized munition (for delivering it through a well to the center of the oil formation) can be provided by a nuclear landmine. As for the radioactive contamination of oil after a nuclear explosion, it became known that liquid hydrocarbons do not dissolve or adsorb radioactive fragments of heavy nuclei. But this had to be verified experimentally in natural conditions," - the history of the use of

nuclear explosions for industrial purposes is described in detail by the "insider", scientist Viktor Ivanovich Zhuchikhin in his autobiographical book "Underground Nuclear Explosions for Peaceful Purposes."

The test was conducted in 1965 at two deposits: the Grachevsky deposit near the town of Meleuz in the Bashkir ASSR and the Osinsky deposit in the Perm region. To completely isolate the explosion, they used cement "plugging" of the well. Residents of the village of Lipovka, located 1.5 km from the Grachevsky deposit, were evacuated to a distance of 3-4 km. Residents of villages 3-4 km away were warned of the need to leave their buildings and go outside at the right time. According to Zhuchikhin, in the end there was no destruction, only the plaster cracked in some houses.

"In the first 2-3 hours, radioactive noble gases were observed to be released from neighboring wells, but the maximum radiation power did not exceed 20 mR/h," the scientist wrote. "After three hours, its level dropped to several microrentgens per hour, meaning there was no dangerous radiation situation. A study of radioactive contamination of oil pumped from neighboring wells showed that the fears were unfounded. Over the next few years of careful observation and control of the oil, no radioactive contamination was detected."

Long-term observations have shown that the oil recovery of the formation after the explosion increases by 20-30%, however, not in the form of a sharp increase in the amount of pumped oil, but gradually, in the form of a slowdown in the decline of oil recovery by the formation. Thus, in one period, the Grachevskoye field produced almost four times more oil than the similar neighboring Terekhinskoye field. Subsequently, the technology of intensification of oil production was used at fields in Bashkortostan, the Yakut ASSR, in the Khanty-Mansiysk Autonomous Okrug, the last time in 1987.

## The fate of the deposits

"From my point of view, it is necessary to study the situation on the ground and rank it by the degree of danger to the environment and the population," says Menshchikov.

"Unfortunately, this work has been shifted to local authorities today. But the customers of those works that were in the USSR no longer legally exist. Therefore, the governor and local authorities must allocate money for the study and monitoring of the places where these explosions were carried out, but, unfortunately, you understand that practically no one in the regions has such money. From this point of view, this is a dead-end situation, because the conduct of these explosions and the study at that time were only a primary picture of what was happening. Some of the short-lived radionuclides have long since decayed, leaving long-lived ones. A new picture of the event is needed."



*Kazakh SSR, Semipalatinsk test site. Site of underground nuclear explosion. Photo: V. Pavlunina and Dmitry Sokolov / TASS Photo Chronicle*

We have a very strong specialized organization, Gidrospetsgeologiya, which is engaged in studying the behavior of radioactive waste at certain depths. And it would be logical for those specialists who are still in our ranks, who carried out underground nuclear explosions and know all the intricacies, to monitor the sites of these explosions together with Gidrospetsgeologiya. And from any point of view - both environmental and radiation-nuclear safety - this must be done. But so far, unfortunately, such a decision has not been made. Although Academician Myasoedov proposed to classify these places as special radioactive waste.

According to the scientist, if the technology is fully observed, there should be no release of radionuclides into the environment. An example of a violation of technology was the contamination of oil in the Osinskoye field. "To our great surprise, oil from wells near the epicenter of the nuclear explosion turned out to be radioactive. An unimaginable noise arose. Specialists from PromNIIproekt of the Ministry of Medium Machine Building who arrived at the scene found out that Perm oil producers, using the technology of intensifying oil production by pumping water into the oil reservoir, pumped a significant amount of it into the center of the nuclear explosion. The water dissolved the radioactive products of the explosion and, mixing with the oil, made it unsuitable for use," Zhuchikhin noted. As a result, nuclear explosions were not used for these purposes for 10 years, but they returned to them in the 1980s. The program of peaceful nuclear explosions was finally curtailed after the accident at the Chernobyl Nuclear Power Plant in 1986.

However, there are concerns that radioactive waste formed in the subsoil as a result of nuclear charges detonated at national economic facilities may gradually enter oil pipelines and field equipment as a result of the impact of natural and man-made processes occurring in the subsoil on the deposits. "At oil and gas fields, radioactive waste and unreacted nuclear fuel are actively included in the development process and are carried to the surface along with the extracted products, contaminating field equipment and pipelines with radionuclides. They also penetrate through the annular space of technological wells into the overlying oil deposits, formation and ground waters," write specialists from the Gubkin Russian State University of Oil and Gas in their article.

According to Valery Menshchikov, firstly, when issuing licenses for, say, oil and gas extraction work in certain places, all this is taken into account. "Another issue is that there really are oil extraction sites (in the Urals, for example), where there are natural radionuclides that pollute the equipment. Well, and some of them end up in the extraction product. But these are not places where nuclear explosions are carried out in absolute terms. No one would issue licenses for this in places where nuclear explosions are carried out. However, it is necessary to conduct research and monitoring of those places where industrial nuclear explosions have occurred, because enough time has already passed, and it is necessary to understand the degree of danger that could actually arise somewhere," Menshchikov concluded.

Author: Maria Sannikova



ОБЩЕСТВО

#80-ЛЕТИЕ ПОБЕДЫ

## К 80-летию Победы калужским ветеранам выплатят по миллиону рублей

Россия • Последние обновления: 09/01/2025 — 16:10



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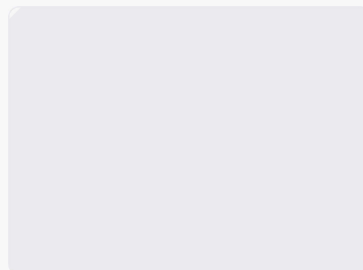


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Ветеранам Великой Отечественной войны в Калужской области выплатят по миллиону рублей. Об этом решении губернатор Калужской области Владислав Шапша написал в своем Telegram-канале.

**Владислав Шапша**

губернатор Калужской области

«По инициативе президента России Владимира Путина этот год объявлен Годом Защитника Отечества. 9 Мая мы отметим 80-летие Великой Победы. Принял решение о единовременной денежной выплате участникам и инвалидам Великой Отечественной войны – по 1 миллиону рублей».

Шапша также добавил, что он дал поручение подготовить соответствующий нормативный документ. По его словам, в феврале на сессии Заксобрания депутаты рассмотрят этот вопрос.

Об аналогичной выплате заявили власти Самарской области. В настоящий момент там проживают 117 участников Великой Отечественной войны. Их средний возраст – 100 лет.

Ранее сообщалось, что к 80-летию Победы в Великой Отечественной войне в России поставят **мюзикл по мотивам кинофильма «Летят журавли»**. Премьера пройдет в одном из музыкальных театров страны. О работе над мюзиклом на основе фильма Михаила Калатозова рассказал композитор Артур Байдо.

Автор: Ксения Фомченко

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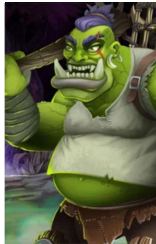


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